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CURRICULUM VITAE

Vahid Ebadat, Ph.D., M.Inst.P, MIEE, C.Eng., C.Phys.
Vice President

CHILWORTH TECHNOLOGY, Inc.

Education

Bachelor of Science, Electrical Engineering, Southampton University (U.K.) - 1985
Doctor of Philosophy, thesis on "Electrostatic Hazards Associated with Pneumatic Conveying and Storage of Powders", Southampton University (U.K.) - 1989

Certifications and Affiliations

Chartered Engineer
Chartered Physicist
Member, Institute of Electrical Engineers
Member, Institute of Physics
Member, National Fire Protection Association (NFPA) 77, Technical Committee on Static Electricity
Member, National Fire Protection Association (NFPA) 654, Technical Committee on Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids.
Member, American Society for Testing and Materials (ASTM) Committee E-27 on Hazard Potential of Chemicals

Specialist Areas of Expertise

Static Electricity Hazards
Dust Explosions
Gas / Vapor Explosions
Fire/Explosions Properties of Solids, Liquids, Gases and Mists
Safety, Chemical Handling
Classification of Hazardous Areas
Transportation of Dangerous Goods

Experience

Dr. Vahid Ebadat, is the Vice President of Chilworth Technology, Inc., Princeton, New Jersey. He has worked extensively as a Process and Operational Hazards Consultant for the chemical, pharmaceutical, food and petrochemical industries. Dr. Ebadat is a regular speaker at training courses in controlling electrostatic hazards and dust explosions and is a member of NFPA 77, NFPA 654, and ASTM E27. Dr. Ebadat's research has culminated in the publication of industrial guidelines on electrostatic hazards associated with pneumatic transfer and storage of powders and numerous papers and articles.

Patents

Quasi-Conductive Anti-Incendiary Flexible Intermediate Bulk Container, Patent Number: 5,478,154, December 26, 1995.

Papers, Articles, Courses and Presentations

- V. Ebadat, "*Dust Explosion Hazard Assessment*" at the ASSE "Safety 2005" Professional Development Conference & Exposition on June 12th – 15th, 2005 in New Orleans, LA.
- V. Ebadat, "*Electrostatic Hazards and the Control of Dust Explosions*" at the ACS MARM Meeting part of AIChE on May 22nd – 25th, 2005 at Rutgers Campus, New Brunswick, NJ.
- V. Ebadat, "*Electrostatic Hazards Associated with Liquid and Powder Processing*" at the ASC (Adhesive & Sealant Council) Spring Convention & Exposition on April 17th – 20th, 2005 in Columbus, OH.
- V. Ebadat, "*Electrostatic Hazards Associated with FIBCs*" at the FIBCA Spring Meeting on April 7th, 2005 in Las Vegas, NV.
- V. Ebadat, "*Safe Handling of Flammable Liquids*" at the 2005 Allianz Risk Consultants Conference on February 9th, 2004 in Hollywood, CA.
- V. Ebadat, "*Dust Explosion Hazard Assessment*" at the 2004 ASSE Professional Development Conference and Exhibition on June 7th-10th, 2004 in Las Vegas, NV.
- V. Ebadat, "*Electrostatic Hazards and Their Control in Particulate Solids Storage, Handling and Processing*" at the 2004 Aluminum Powder & Paste Safety Workshop on June 6th-9th, 2004 at the Seaview Marriott, near Atlantic City, NJ.
- V. Ebadat, "Dust Explosion Hazards" lecture at the AIChE Spring Symposium Meeting, presented at the Essex House, West Orange, NJ, April 20, 2004.
- V. Ebadat, "Dust Explosion Hazards" lecture at the NJ State Industrial Safety Committee in partnership with the NJ Dept of Labor & NJ State Safety Council, presented at Rider University, Lawrenceville, NJ, January 13, 2004.

- V. Ebadat, "Prevention of Fire & Dust Explosions", seminar at the U.S. Dept. of Labor, OSHA Office of Training and Education at the OSHA Training Institute, Arlington Heights, IL, December 9, 2003.
- V. Ebadat, "Fire & Explosion Hazards in handling and processing of Gases/Vapors/Solvents/Powder Clouds – Analysis, Prevention & Control", seminar at the Hotel Imperial, New Delhi, India, October 17-18, 2003.
- V. Ebadat, "Fire & Explosion Hazards due to Static Electricity-Analysis, Prevention & Control", seminar at the Hotel Sea Princess, Mumbai, India, October 13-14, 2003.
- V. Ebadat, "Is Your Dust Collection System an Explosion Hazard?"; published in the *Chemical Engineering Progress Magazine*, October 2003, pp. 44-48.
- V. Ebadat, C. Laing, "Dust Explosions: Is Your Safety Blanket in Place?"; published in *the Chemical Engineering Magazine*, April 2003, featured report, pp. 50-54.
- V. Ebadat, "Electrostatic Hazards and Their Control in Particulate Solids Storage, Handling, and Processing" and "Hazards of FIBC Filling and Discharging and Their Control", presentations at the 2003 Powder & Bulk Solids Forum, Rosemont, IL, May 2003.
- V. Ebadat, "Dust Explosions Prevention and Protection Techniques," presentation at the 2002 Powder & Bulk Solids Show & Conference, Rosemont, IL, May 2002.
- V. Ebadat, "Fire & Explosion Characteristics of Powders," presentation to the Society for Chemical Hazard Communication (SCHC), Las Vegas, NV, April 2002.
- V. Ebadat, "Understanding & Controlling Static Electricity," AIChE 2002 Spring National Meeting, New Orleans, LA, March 2002.
- V. Ebadat, "Testing and Qualification of Type C/D FIBC's," presentation at the AIChE 2002 Spring National Meeting, New Orleans, LA, March 2002.
- V. Ebadat, J.C. Mulligan, "Reducing Electrostatic Hazards Associated with Chemical Processing Operations. "; published in the *Handbook of Chemical Health and Safety*, Robert J. Alaimo, Editor, American Chemical Society, Washington, D.C., Oxford University Press, 2001, Chapter 36.
- V. Ebadat, "Assessment of Electrostatic Hazards Two Case Studies" 2001 Chem Show Conference/Exhibition, October 23, 2001, New York, NY.
- V. Ebadat, "Dust Explosion Prevention Techniques" Fine Powder Processing 2001, Oct. 3, 2001, Penn State University
- V. Ebadat, "Understanding & Controlling Static Electricity," AIChE 2001 Spring National Meeting, Houston, TX, April 2001.

- V. Ebadat, J.C. Mulligan, R. Wedlich, "Chilworth 5-Day Process Safety Training Courses" Las Vegas, NV October 16-20, 2000
- V. Ebadat, "Exposing the Causes of Mill Dust Explosions" *Chemical Processing*, August 2000, pp: 58-59.
- V. Ebadat, M. Carneiro, R. Wedlich, "Chilworth 5-Day Process Safety Training Courses" Washington, DC June 5-9, 2000
- V. Ebadat, M. Carneiro, R. Wedlich, "Chilworth 5-Day Process Safety Training Courses" San Juan, Puerto Rico March 20-24, 2000
- V. Ebadat, "Preventing Fires & Explosions in Centrifuges, Reactors and Mixing Vessels" Neutronics – *Safety Day*, May 24, 2000.
- V. Ebadat, M. Carneiro, "Industrial Electrostatic Hazards and Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, Jan. 24-27, 2000, Boca Raton, FL.
- V. Ebadat, M. Carneiro, R. Wedlich, "Chilworth 5-Day Process Safety Training Courses" Chicago, IL October 4-8, 1999
- V. Ebadat, M. Carneiro, R. Wedlich, "Chilworth 5-Day Process Safety Training Courses" Albany, NY, June 21-25, 1999
- V. Ebadat, "Keeping Centrifugation Safe" *Chemical Processing*, April 1999, pp: 57-60.
- V. Ebadat, M. Carneiro, "Prevention of Fires and Explosions During Industrial Drying of Solids" Center for Professional Advancement (CPA) course, April 22 through 23, 1999, New Brunswick, NJ.
- V. Ebadat, M. Carneiro, "Understanding and Managing Flammable Atmospheres" Center for Professional Advancement (CPA) course, March 25 through 26, 1999, Boca Raton, FL.
- V. Ebadat, M. Carneiro, "Industrial Electrostatic Hazards and Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, Feb. 8-11, 1999, Boca Raton, FL.
- V. Ebadat, "Investigation: How Dust Exploded During Railcar Loading" *Powder & Bulk Engineering*, January 1999.
- V. Ebadat, M. Carneiro, "Understanding and Managing Flammable Atmospheres" Center for Professional Advancement (CPA) course, Oct. 15 through 16, 1998, New Brunswick, NJ.
- V. Ebadat, M. Carneiro, "Industrial Electrostatic Hazards and Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, Sept. 14-17, 1998, New Brunswick, NJ.
- V. Ebadat, Risk Analysis, Safety and Loss Prevention, (Part 2): "Computer-aided Process Hazard Assessment" Chemical Engineering Exposition & Conference, June 3-4, 1998, Houston, TX.

- V. Ebadat, M. Carneiro, R. Wedlich, "Chilworth 5-Day Process Safety Training Courses" Philadelphia, PA, May 11-15, 1998
- V. Ebadat, M. Carneiro, "Prevention of Fires and Explosions During Industrial Drying of Solids" Center for Professional Advancement (CPA) course, April 6 through 7, 1998, New Brunswick, NJ.
- V. Ebadat, M. Carneiro, "Understanding and Managing Flammable Atmospheres" Center for Professional Advancement (CPA) course, March 9 through 11, 1998, Boca Raton, FL.
- V. Ebadat, M. Carneiro, "Industrial Electrostatic Hazards and Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, Jan. 12-15, 1998, Boca Raton, FL.
- V. Ebadat, M. Carneiro, "Industrial Electrostatic Hazards and Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, Sept. 22-25, 1997, New Brunswick, NJ.
- V. Ebadat, "Preventing Fine Powder Explosions" Fine Powder Processing '97, Sept. 17, 1997, Penn State University
- V. Ebadat, M. Carneiro, "Chilworth 5-Day Process Safety Training Courses" Raleigh, NC, Sept. 8-12, 1997
- V. Ebadat, "Testing to Assess Powders' Fire and Explosion Hazards" and "Electrostatic Hazards Associated With the Use of FIBCs in Flammable Atmospheres" International Conference on Fire Safety, July 24, 1997, Columbus, OH
- V. Ebadat, "Reducing Electrostatic Hazards" Chemical Engineering Magazine, July, 1997
- V. Ebadat, "Electrical Area Classifications for Flammable Dust Operations" Plant Services Magazine, June, 1997
- V. Ebadat, G. Pilkington, "Chilworth 5-Day Process Safety Training Courses" Chicago, IL, June 16-20, 1997
- V. Ebadat, "Controlling Electrostatic Hazards" and "Preventing Dust Explosions During Handling and Processing of Powders" Powder & Bulk Solids Conference/Exhibition, May 6, 1997, Chicago, IL.
- V. Ebadat, M. Carneiro, "Understanding and Managing Flammable Atmospheres" Center for Professional Advancement (CPA) course, April 17 through 18, 1997, New Brunswick, NJ.
- V. Ebadat, "Instruments and Testing to Prevent Explosion and Fires" Instrument Society of America (ISA) Chempid Symposium, April 8, 1997, New Orleans, LA.

- V. Ebadat, J.C. Mulligan, "Thermal Hazards: How to Identify and Minimize Them in Your Drying Process" Powder & Bulk Engineering Magazine, April, 1977
- V. Ebadat, "Instrument Testing to Prevent Explosion and Fire" Instrument Society of America (ISA) Tech-Expo '97, March 25, 1997, Giant Stadium, NJ.
- V. Ebadat, G. Pilkington, "Industrial Electrostatic Hazards and Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, February 24 through 27, 1997, New Brunswick, NJ.
- V. Ebadat "Testing Can Prevent Fires, Explosions in Plants" ISA InTech Magazine, February, 1997.
- V. Ebadat, "Dust Explosion Hazards" and "Controlling Electrostatic Hazards" 1996 Powdex Conference/Exhibition, November 5-7, 1996, Atlanta, GA.
- V. Ebadat, P. Cartwright and G. Pilkington, "Industrial Electrostatic Hazards and Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, September 30 through October 3, 1996, New Brunswick, NJ.
- V. Ebadat, and I. Pavey, "Electrostatics in the Process Industries: Problems, Measurements and Applications" Center for Professional Advancement (CPA) courses, September 9 through 10, 1996, New Brunswick, NJ.
- V. Ebadat, J. Mulligan, "Testing the Suitability of FIBCs for Use in Flammable Atmospheres" *Process Safety Progress*, Fall 1996, Vol. 15, No. 3, pp: 123-127.
- V. Ebadat, "Electrostatic Hazards in the CPI" *Chemical Engineering*, July 1996, Vol. 103, No. 7, pp: 141-144.
- V. Ebadat, "Controlling Electrostatic Hazards" Southern Pharmaceutical Manufacturing Show & Conference (SouthPharm '96), May 22-23, 1996, Raleigh, NC.
- V. Ebadat, "Dust Explosion Hazards", "Preventing Dust Explosions During Handling and Processing of Powders" and "Controlling Electrostatic Hazards" 1996 Powder & Bulk Solids Conference and Exhibition, May 7-9, 1996, Chicago, IL.
- V. Ebadat, G. Pilkington and J. Singh, "Process Safety Training Courses" in Puerto Rico, sponsored by Chilworth Technology, Inc. and Hazard Evaluation Laboratories, Inc., April 22-26, 1996, Caribe Hilton Hotel, San Juan, PR.
- V. Ebadat, P. Cartwright and G. Pilkington, "Industrial Electrostatic Hazards and Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, January 29 through February 1, 1996, Ft. Lauderdale, FL.

- V. Ebadat, "Controlling Electrostatic Hazards" and "Dust Explosion Hazards seminar" Western Pharmaceutical Manufacturing Show & Conference (WestPharm '96), January 23-24, 1996, San Diego, CA.
- V. Ebadat and A. Starkie, "Minimizing reaction runaway risks" *Chemical Processing*, November 1995, pp: 153.
- V. Ebadat and J.C. Mulligan, "Test results: Comparing FIBC fabrics for use in flammable atmospheres" *Powder & Bulk Engineering*, October 1995, Vol. 9, No. 10, pp:21-27.
- V. Ebadat, P. Cartwright and G. Pilkington, "Industrial Electrostatic Hazards" and "Preventing Dust Explosions" Center for Professional Advancement (CPA) courses, September 18-21, 1995, East Brunswick, NJ.
- V. Ebadat and G. Pilkington, "Assessing dust explosion hazards in powder handling operations," *Chemical Processing*, September 1995, Vol. 58, No. 9, pp: 74-80.
- V. Ebadat "Guarding Against Electrostatic Hazards" *Chemical Processing*, August 1995, Vol. 58, No. 8, pp: 82-83.
- V. Ebadat, J.C. Mulligan and R.J. Pappas, "Ungrounded Static Protective FIBCs" Electrostatics '95 2-5 April 1, 1995, University of York, U.K.
- V. Ebadat, P. Cartwright and J. Keenan, "Industrial Electrostatic Hazards" & "Preventing Dust Explosions" CPA Courses, January 23-26, 1995, Ft. Lauderdale, FL.
- V. Ebadat, J.C. Mulligan, R.J. Pappas and S. Singh, "Experimental Research on Static Protective Flexible Intermediate Bulk Containers" IBC Conference - "Process Safety-The European Dimension" November 16-17, 1994, London, U.K.
- V. Ebadat, Technical Advisors for IChemE Video Training Package in Controlling Electrostatic Hazards.
- V. Ebadat and S. Singh, "Importance of Humidity on the Control of Electrostatic Charging of high density Polyethylene Powder", PNEUMATECH 4, 4th Int. Conference on Pneumatic Conveying Technology, 26-28 June 1990, Glasgow, Scotland.
- V. Ebadat, "Process Hazards Evaluation" Puerto Rico Pharmaceutical Manufacturers Show & Conference (PuertoPharm '94); Sept. 16-17, 1994, Robert Clemente Coliseum, San Juan, Puerto Rico.
- V. Ebadat, P. Cartwright, H. Palmer and A. Starkie, "Process Safety Training Courses" in Puerto Rico, sponsored by Bristol-Myers Squibb and Chilworth Technology, Inc., September 14-16, 1994, Caribe Hilton Hotel, San Juan, PR.

- V. Ebadat, "Removing Electrostatic Charges" *Chemical Processing*, July 1994, Vol. 57 No.7, pp:66-68.
- V. Ebadat, "Identifying electrostatic hazards from small containers" *Chemical Processing*, June 1994, Vol. 57 No. 6, pp:98-100.
- V. Ebadat, "Electrostatic Hazards in Chemical Industry" 28th Annual Loss Prevention Symposium AIChE meeting, April 17-21, 1994, Atlanta, Georgia.
- V. Ebadat, "Industrial Electrostatic Hazards and Preventing Dust Explosions" CPA courses, June 8-11, 1992; February 1-4, 1993 and January 24-27, 1994, Deerfield Beach, FL.
- V. Ebadat, "Electrostatic Hazards in the Chemical Industry" 28th Annual Loss Prevention Symposium, AIChE National Meeting, December 1993.
- V. Ebadat, "Keep Dust-Cloud Explosions at Bay" *Chemical Engineering*, December 1993, Vol. 100 No. 12, pp:123-126.
- V. Ebadat, P. Cartwright and S. Singh "Industrial Electrostatic Hazards" and "Preventing Dust Explosions" CPA courses, August 2-5, 1993, Chicago, IL.
- V. Ebadat, "Dust Explosion & Fire Hazards Evaluation", Technical Paper.
- V. Ebadat, "Industrial Electrostatic Hazards" & "Preventing Dust Explosions" courses for the Technical University of Nova Scotia, June 14-18, 1993; Toronto, Ontario.
- V. Ebadat and P. Cartwright, "Electrostatic Hazards from small non conducting containers for flammable liquids" 27th Annual Loss Prevention Symposium, AIChE, Spring National Meeting, March 29 through April 1, 1993.
- V. Ebadat, "Controlling Electrostatically initiated fire & explosion hazards" *Chemical Processing*, August 1992., Vol. 55 No. 8, pp: 78-80.
- V. Ebadat and D.K. Davies, "Electrostatic problems in powder handling" International Conference on Bulk Materials Handling - Toward the year 2000, October 29-31, 1991, London.
- V. Ebadat, "Controlling Explosion and Fire Hazards" *Safety Management*, October 1991, Vol. 7, No. 9, pp: 42-45.
- V. Ebadat and P. Cartwright, N. Maddison and A. Starkie, "Electrostatic Hazards, Dust Explosions and Chemical Reaction Hazards" Technical Safety Courses, jointly sponsored by the United Kingdom IChemE, IMechE and IMetals, October 15-17, 1991, York, U.K.
- V. Ebadat, "Minimizing the Hazards" *Solids Handling*, May/June 1991, Vol. 13, No. 3, pp: 25-27.
- V. Ebadat, "Influence of Powder Streaming current on surface potential of balked high density

Polyethylene" Inst. of Physics Conference, Series No. 118: Section 2; Electrostatics '91, Oxford, U.K.

- V. Ebadat and P. Cartwright, "Electrostatic Hazards in the Use of Flexible Intermediate Bulk Container" HAZARDS XI-New Directions in Process Safety Symposium, April 16-17, 1991, for the IChemE and European Federation of Chem. Eng., Umist Manchester, U.K.
- V. Ebadat and P. Cartwright, "Electrostatic hazards associated with the use of flexible intermediate bulk containers in flammable atmospheres" Electrostatics '91, 8th International Conference, Oxford, April 10-12, 1991.
- V. Ebadat, P. Cartwright, and N. Maddison, "Industrial Electrostatic Hazards and Preventing Dust Explosions" jointly sponsored by the IChemE, IMechE and IMetals, February 19-20, 1991, United Kingdom.
- V. Ebadat and P. Cartwright, "Electrostatic hazards in the use of flexible intermediate bulk containers" IChemE Symposium Series No. 124., P (1991) 105-117.
- V. Ebadat, interviewed for "Proven in the flash zone" *Hazardous Cargo Bulletin*, January 1991, Vol. 12, No. 1, p: 30.
- V. Ebadat and P. Cartwright, "Industrial Electrostatic Hazards and Preventing Dust Explosions", jointly sponsored by the IChemE, IMechE and IMetals, October 8-9, 1990, United Kingdom.
- V. Ebadat, "Powder Assessment" *Solids Handling*, January/February 1990, Vol. 12, No. 1, pp: 39-43.
- V. Ebadat, contributor to "Mulox Anti-Static FIBCs-Working Report" *International Bulk Journal* December 1990, Vol. 10, No. 12, p: 101.
- V. Ebadat, "Laboratory Tests for Workstation Materials" ESD90-Electrostatic Damage to Electronics Conference, Inst. of Physics, April 25-26, 1990, Polygon Hotel, Southampton, U.K.
- V. Ebadat, A.G. Bailey and S. Singh, "The influence of a superimposed electric field on triboelectrification of powder particles in pneumatic conveying system" *Journal of Electrostatics*, 24 (1990) 257-270.
- V. Ebadat, "Electrostatic Forces in Manufacturing Process" short course for the Inst. of Physics, February 7, 1990, London.
- V. Ebadat, P. Cartwright, K. Davies, S. Singh and P. Zeeuwen, "Controlling the Electrostatic Hazard and Preventing Dust Explosions", jointly sponsored short courses by the IChemE, IMechE and IMetals, February 21-22, 1990, United Kingdom.
- V. Ebadat and P. Cartwright, "Electrostatics in Pipes" *Physics World*, August 1990, Vol. 3 No. 8, pp: 20.

V. Ebadat and P. Cartwright, "Removing the Risk of Electrostatic Sparks" *Processing*, October 1989, pp: 69-71.

V. Ebadat, A.G. Bailey and S. Singh, "Fire and Explosion Risk from Static Electricity in Pneumatic conveying and storage silos" 3rd International Conference on Pneumatic Conveying Technology, March 24-26, 1987, The Grand Hotel, Jersey, Channel Islands.